ETHzürich

ICB seminar series 2018/19
chairman: Prof. Dr. Chih-Jen Shih

ADVANCES IN MECHANISTIC UNDERSTANDING AND MODELING OF PROTEIN PROCESS CHROMATOGRAPHY

Prof. Dr. Giorgio Carta
Department of Chemical Engineering
University of Virginia

ETH Hönggerberg, HCI J 7
Wednesday, 05/09/2018, 17.15 h

Abstract: Understanding and modeling protein chromatography is critical to the design and optimization of biopharmaceutical manufacturing processes. The critical factors are competition for binding sites and the mass transfer kinetics that determine the rate at which protein-surface interactions take place. Using industrially relevant antibodies, we demonstrate how high-throughput screening methods, confocal microscopy, and biolayer interferometry can be used to successfully predict chromatographic separation performance and define a robust parameter space. Both detailed mechanistic models, based on extensive biomolecular-level information, and hybrid models, that leverage large empirical datasets, are discussed and compared as to their virtues in the practical biologics manufacturing context.

Bio: Giorgio Carta received his PhD in Chemical Engineering from the University of Delaware in 1984 and is currently the Lawrence R. Quarles Professor at the University of Virginia. He has published over 150 archival journal articles in the area of adsorption and ion exchange with emphasis on protein chromatography. He has co-authored the book "Protein Chromatography – Process Development and Scale-Up", Wiley (2010), and Section 16 "Adsorption and Ion Exchange" of Perry's Chemical Engineers' Handbook, 7th, 8th, and 9th edition. He has served as a member of the Organizing Committee of the International Symposium on Preparative and Process Chromatography (PREP) since 1997 and as the PREP Symposium Chair annually since 2009. He is also involved extensively in professional education including a short course in protein chromatography held at the University of Virginia and at BOKU, Vienna since 2005. Giorgio is an Editor of Biotechnology Journal and a member of the Editorial Board of Separation Science & Technology. He is a consultant for a number of chemical and pharmaceutical companies and a Fellow of AIChE.

ICB Institute for Chemical and Bioengineering

DCHAB
Department of Chemistry and Applied Biosciences